

[Name of Document] Claims

[Claim 1]

A control method provided for a photographing apparatus as a control method having a first mode for generating an output image by taking one input image and a second mode for generating an output image by taking a plurality of input images successively whereby

at least one of a first exposure time, which is an exposure time of a photographing operation to take an input image on the assumption that said photographing operation is to be carried out in said first mode, and a second exposure time, which is an exposure time of a photographing operation to take a plurality of input images on the assumption that said photographing operation is to be carried out in said second mode, is compared with a predetermined threshold value

in order to produce a result of determination as to whether to carry out a photographing operation in said first mode selected as a photographing mode or carry out a photographing operation in said second mode selected as said photographing mode.

[Claim 2]

A control method provided for a photographing apparatus in accordance with claim 1, said control method

comprising:

a first determination step of producing a result of determination as to whether or not said first exposure time is equal to or shorter than a first threshold value;

a first decision step of making a decision to take an image in said first mode if said determination result produced at said first determination step indicates that said first exposure time is equal to or shorter than said first threshold value; and

a second decision step of making a decision to take an image in said second mode if said determination result produced at said first determination step indicates that said first exposure time is neither equal to nor shorter than said first threshold value.

[Claim 3]

A control method provided for a photographing apparatus in accordance with claim 2 wherein said first threshold value is a limit of exposure times not causing effects of hand trembling on said input image taken in said first mode.

[Claim 4]

A control method provided for a photographing apparatus in accordance with claim 2 wherein said first threshold value is a value based on a focal distance used

at an image-pickup time to take said input image.

[Claim 5]

A control method provided for a photographing apparatus in accordance with claim 2 wherein:

there is further included a second determination step of producing a result of determination as to whether or not said second exposure time is equal to or shorter than a second threshold value if said determination result produced at said first determination step indicates that said first exposure time is neither equal to nor shorter than said first threshold value; and

said second decision step is executed to make a decision to take an image in said second mode if said determination result produced at said second determination step indicates that said second exposure time is equal to or shorter than said second threshold value.

[Claim 6]

A control method provided for a photographing apparatus in accordance with claim 5 wherein said second threshold value is a limit of exposure times not causing effects of hand trembling on said input image taken in said second mode.

[Claim 7]

A control method provided for a photographing apparatus in accordance with claim 5 wherein said second threshold value is a value based on a focal distance used at an image-pickup time to take said input image.

[Claim 8]

A control method provided for a photographing apparatus in accordance with claim 5, said control method further including

a third decision step of making a decision to take an image in said first mode if said determination result produced at said first determination step indicates that said first exposure time is neither equal to nor shorter than said first threshold value and said determination result produced at said second determination step indicates that said second exposure time is neither equal to nor shorter than said second threshold value.

[Claim 9]

A control method provided for a photographing apparatus in accordance with claim 5 wherein:

said second determination step further includes a step of producing a result of determination as to whether or not said second exposure time is equal to or longer than the larger one of a threshold value based on a proper exposure time found from the brightness of a

photographing object and a threshold value based on an image-pickup interval of successive image-pickup operations carried out by said photographing apparatus at a highest speed; and

said second decision step is a step of making a decision to take an image in said second mode if said determination result produced at said second determination step indicates that said second exposure time is equal to or shorter than said second threshold value and that said second exposure time is equal to or longer than said larger one of said threshold value based on a proper exposure time found from the brightness of said photographing object and said threshold value based on said image-pickup interval of successive image-pickup operations carried out by said photographing apparatus at a highest speed.

[Claim 10]

A control method provided for a photographing apparatus in accordance with claim 5 whereby

at said second determination step, the larger one of a threshold value based on a proper exposure time found from the brightness of a photographing object and a threshold value based on an image-pickup interval of successive image-pickup operations carried out by said

photographing apparatus at a highest speed is used as said second threshold value, and said second exposure time is compared with said threshold value in order to produce a result of determination as to whether or not said second exposure time is equal to or smaller than said threshold value.

[Claim 11]

A control method provided for a photographing apparatus in accordance with claim 1 wherein

said photographing apparatus has an image-pickup means for taking said input image and

in said second mode:

positional relations among positions of a plurality of said input images taken by said image-pickup means are detected;

pixels of said input images are identified on the basis of said detected positional relations as pixels to be used for inference of a pixel value at the position of every pixel on said output image; and

said output image is generated by inference of a pixel value at the position of every pixel on said output image on the basis of pixel values of said identified pixels on said input images.

[Claim 12]

A control method provided for a photographing apparatus in accordance with claim 11 whereby, in said second mode, said photographing apparatus detects positional relations among positions of a plurality of said input images by using one of said input images as a reference wherein said input image used as a reference is an input image taken at a middle time in the middle of times at which said input images are taken or an input image taken at a time close to said middle time.

[Claim 13]

A control method provided for a photographing apparatus in accordance with claim 11 whereby, in said second mode, as said output image, said photographing apparatus generates an image, which is observed at a central portion included in a range of a photographing object projected on said input images as a portion excluding peripheral portions of said range, and has a pixel pitch smaller than the pixel pitch of each of said input images.

[Claim 14]

A control method provided for a photographing apparatus in accordance with claim 13 whereby, in said second mode, an output image is generated as an image having a pixel count equal to the pixel count of said

image-pickup means.

[Claim 15]

A control method provided for a photographing apparatus in accordance with claim 11 whereby,

in said second mode, said image-pickup means employed in said photographing apparatus treats a plurality of pixels owned by said image-pickup means as a group in order to output an output image having a pixel count smaller than the number of pixels owned by said image-pickup means.

[Claim 16]

A control method provided for a photographing apparatus in accordance with claim 11 whereby, in said second mode, said photographing apparatus infers three pixel values for the position of every pixel on said output image having three pixel values per pixel on the basis of pixel values of pixels on a plurality of input images each having one pixel value per pixel.

[Claim 17]

A control method provided for a photographing apparatus in accordance with claim 1, said control method comprising:

a determination step of producing a result of determination as to whether or not said second exposure



time is equal to or longer than a threshold value based on a proper exposure time found from the brightness of a photographing object;

a first decision step of making a decision to take an image in said second mode if said determination result produced at said determination step indicates that said second exposure time is equal to or longer than said threshold value; and

a second decision step of making a decision to take an image in said first mode if said determination result produced at said determination step indicates that said second exposure time is neither equal to nor longer than said threshold value.

[Claim 18]

A control method provided for a photographing apparatus in accordance with claim 1, said control method comprising:

a determination step of producing a result of determination as to whether or not said second exposure time is equal to or longer than a threshold value based on an image-pickup interval of successive image-pickup operations carried out by said photographing apparatus at a highest speed;

a first decision step of making a decision to take

an image in said second mode if said determination result produced at said determination step indicates that said second exposure time is equal to or longer than said threshold value; and

a second decision step of making a decision to take an image in said first mode if said determination result produced at said determination step indicates that said second exposure time is neither equal to nor longer than said threshold value.

[Claim 19]

A control apparatus provided for a photographing apparatus having a first mode for generating an output image by taking one input image and a second mode for generating an output image by taking a plurality of input images successively wherein

at least one of a first exposure time, which is an exposure time of a photographing operation to take an input image on the assumption that said photographing operation is to be carried out in said first mode, and a second exposure time, which is an exposure time of a photographing operation to take a plurality of input images on the assumption that said photographing operation is to be carried out in said second mode, is compared with a predetermined threshold value

in order to produce a result of determination as to whether to carry out a photographing operation in said first mode selected as a photographing mode or carry out a photographing operation in said second mode selected as said photographing mode.

[Claim 20]

A control program to be executed by a computer as a program for controlling a photographing apparatus having a first mode for generating an output image by taking one input image and a second mode for generating an output image by taking a plurality of input images successively whereby

at least one of a first exposure time, which is an exposure time of a photographing operation to take an input image on the assumption that said photographing operation is to be carried out in said first mode, and a second exposure time, which is an exposure time of a photographing operation to take a plurality of input images on the assumption that said photographing operation is to be carried out in said second mode, is compared with a predetermined threshold value

in order to produce a result of determination as to whether to carry out a photographing operation in said first mode selected as a photographing mode or carry out

a photographing operation in said second mode selected as  
said photographing mode.